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NOTES ON *CHARAXES* (LEP., NYMPHALIDAE) IN THE HOPE DEPARTMENT OF ENTOMOLOGY, UNIVERSITY OF OXFORD

By Professor G. D. Hale Carpenter, M.B.E., D.M., Pres. R.E.S.

The Hope Department is particularly well provided with Rhopalocera from central and east Africa, and having completed a wholesale rearrangement of *Charaxes*, with incorporations, I find a number of points worth recording. The notes follow the paper by Poulton (1926) in the order of the species, which was founded on the work by Rothschild and Jordan. I have endeavoured not to reduplicate information already given in these and other works cited under " References," and data concerning localities only should be taken to indicate an extension of the known range.

Charaxes fulvescens monitor Rothschild.

South-eastern Sudan : Mongalla Province, Acholi hills, Lotti, 3000 feet, vii.1930 (*F. Moysey*), 2 ♂.

Charaxes boueti rectans Rothschild & Jordan.

Northern Uganda : West Madi, Mt. Otze, 30.iv.1927 (*G. D. Hale Carpenter*), 1 ♂.

Charaxes boueti macclounii Butler.

Nyasaland : 1914–1917 (*J. H. Mason*), 2 ♂; Cholo, 2700 feet, 3.ix.1927 (*R. C. Wood*), 1 ♂. These have the black markings very greatly reduced above, and the underside with the silver band absent or very narrow, and of an almost uniform light yellow-brown with the normal darker markings faintly indicated in slightly darker shades. The reduction of black markings reaches its maximum in Wood's specimen; on the fore-wing the submarginal black band has become an interrupted series of almost linear markings. The black mark across the end of the cell is merely a slight accentuation of the anterior disco-cellular vein, and only a faint smudge represents the black sub-basal mark in area 1b. Other black markings are also very greatly reduced. The uniform coloration of the underside strongly suggests that this is a dry-season form, and such dates as are available on specimens support this. The hot dry season in Nyasaland is during three months before the rains, which occur between December and April.

Two males of this form from Zomba, September, 1920, and one from Mt. Mlanje, October, 1913, are in the British Museum (Natural History). Van Someren (1928, Pl. 67) figures a similar specimen as " a not infrequent variety of *b. lasti* Gr.-Sm.," but the few words of description on p. 143 are not clear, the black markings being described as " so much more definite." Two females at South Kensington from Zomba, September, 1919 and 1920, show similar reduction of black.

Charaxes lucretius Cramer.

Sudan : Bahr-el-Ghazal Province, Congo–Nile divide, Bendere, 2800 feet, 14.vii.1934 (*I. G. Owen*), 1 ♂. Lotti, 3000–3700 feet, October, 1938 (*T. H. E.*

Jackson), 1 ♂. Lotti, 3000 feet, 20.ix.1935 (*I. G. Owen*), 1 ♂. Acholi Hills, Laboni forest, 4000 feet, October, 1938 (*T. H. E. Jackson*), 1 ♂.

North-East Rhodesia : Lower Kalungwisi valley, dense forest, 3500 feet, 17.ix.1908 (*S. A. Neave*). Angola, 1873 (*Rogers*).

Charaxes pelias saturnus Butler.

It is remarkable that this is not represented at Oxford from Uganda whence very large collections have been received. The nearest locality to it is Kitui, Kenya Colony, east of Nairobi. The specimen to which Rothschild and Jordan refer (1900 : 445) may have come from territory to the east of Lake Victoria, for " Uganda " at one time extended to Lake Naivasha. This species is represented from French Congo, Cape Lopez, and from the Belgian Congo, Stanley Falls, by two purchased specimens.

Unlike many species, it seems not to traverse the country south of the Sahara so as to link east with west.

Charaxes pelias harrisoni E. M. Sharpe.

The resemblance of this to *Ch. jasius epijasius* Reiche was mentioned by Poulton. A detailed study of the two forms in the areas where they do, and do not, meet would be of interest.

The under surface of the South African *p. pelias* Cramer differs considerably from that of *p. saturnus* : the latter has on the hind-wing a conspicuous series of large dentate chocolate markings distal to the white band, closely resembling a similar series in *j. epijasius*. But in *p. pelias* these are, by comparison, small. Again, in *j. epijasius*, on the fore-wing distal to the white band, the analogous series of dentate markings is of a more orange-brown colour : in *p. pelias* they are smaller and duller, but in *p. saturnus* larger and brilliantly orange. They are, in *p. harrisoni*, intermediate between those of *p. saturnus* and *j. epijasius*. The most striking feature of the resemblance of *p. harrisoni* to *j. epijasius* is provided on the under surface by the anterior end of the white bar of the fore-wing which in *p. saturnus* usually has some orange replacing white to a variable extent in the bases of areas 6–7. But in *j. epijasius* the white is almost completely replaced by orange-brown from areas 7–5, and from 4–2 in gradually diminishing amount. Now in *p. harrisoni* there is considerable approach to *j. epijasius*; the white in areas 7–3 being largely replaced by orange-brown, and even in 2 to a certain degree. Further examination of a larger series may show that *pelias* is modified in the presence of *jasius*.

A different variation is shown by a female from Tanganyika Territory, near Kilosa, 12.ii.1933 (*B. D. Burtt*). The general effect of the upper surface is much lighter than in normal *p. saturnus* : the yellow-brown is considerably paler and the black band on the fore-wing greatly attenuated by prolongation outwards of the discal yellow areas and the broadening of the marginal spots which have become twice as large as usual. The marginal spots of the hind-wing are greatly elongated inwards, and are almost white in areas 2–3. The tip of the fore-wing is more elongated than is usual in *pelias*, and resembles in shape that of the female *Ch. achaemenes* Felder.

Charaxes hansali baringana Rothschild.

A male of this race was taken by myself, 28.vi.1916, in open, dry, bush country at the south-west angle of Lake Victoria, at approximately 2°40′S.

and 31°15′E. The known range is thus greatly extended, for it has not, hitherto, included TANGANYIKA TERRITORY.

Charaxes castor flavifasciatus Butler.

SOUTH-EAST RHODESIA: Melsetter, Mt. Chirinda, 3800 feet, 12.ix.1907 (*C. F. M. Swynnerton*), 1 ♂. NORTH ZULULAND: Maputa, Sibangwana, 29.x.1936 and xi.–xii.1938 (*H. W. Bell-Marley*), 2 ♂, 1 ♀.

Charaxes brutus natalensis Staudinger.

SOUTH-EAST RHODESIA: Melsetter, iv.1918 (*R. Swynnerton*), 1 ♂. The upperside is normal, but the spots of the underside lack the black border. This variation seems to occur commonly in Abyssinia, where *b. junius* Oberthür and *b. somalicus* Rothschild have the black borders poorly developed or lacking.

Charaxes druceanus druceanus Butler.

TANGANYIKA TERRITORY: Morogoro, 1 ♂. Obtained by A. Loveridge and K. St. A. Rogers during the East African campaign, 1914–18.

Charaxes druceanus kivuanus Jordan.

A female from Dabida mountain, one hundred miles west-north-west of Mombasa, was mentioned by Poulton (1929, *Trans. ent. Soc. Lond.* **77**: 477) but since that date Jordan described *moerens* (1936, *Nov. zool.* **39**: 333) and mistakenly wrote "♀ of *Ch. d. kivuanus* not known." It is therefore interesting to record that the *upper* surface of Poulton's specimen is that of *d. moerens* except that the four submarginal spots of the fore-wing in areas 4, 5, 6, 7, and the two, more proximal, in areas 5 and 6 are less pronounced. On the *under* surface the differences mentioned by Poulton as distinguishing *d. kivuanus* from *d. druceanus* also distinguish the former from *d. moerens*.

Charaxes numenes numenes Hewitson.

A specimen from KENYA COLONY, Nairobi, Kikuyu country, 17.v.1903 (*A. H. Harrison*) seems to mark the eastern limit of this western species. It has been recorded from south-west Abyssinia, but is now noted for the first time from SOUTH SUDAN: Lotti, vii.1930 (*F. Moysey*), 1 ♂, 1 ♀; Lotti, x.1938 (*T. H. E. Jackson*), 1 ♂, 1 ♀; between Lotti and Katire, Onyiro, 4000–6000 feet, vii.1930 (*F. Moysey*), 3 ♂.

Charaxes smaragdalis orientalis Joicey & Talbot.

Two males from west UGANDA, Ankole, Kalinzu forest, 4700–5000 feet, x.1937 (*T. H. E. Jackson*), and one male by the same captor from the Malabigambo forest on the west coast of Lake Victoria, Uganda, xii.1935, are transitional from *s. orientalis* to *s. smaragdalis* Butler as regards the blue pattern of the upperside. Below, however, they agree with the eastern race in having the borders of the wings, distal to the lunular markings, more widely and strongly suffused with grey, and the lunular markings less sharply marked.

Charaxes ameliae amelina Joicey & Talbot.

Three males and a female from CAMEROONS, Bipindi, *ex coll.* Brodie, are of this form. A large number of specimens from the Lomie district of the Cameroons are, however, typical *a. ameliae* Doumet.

Joicey and Talbot, in their description of *a. amelina* (1925, *Ann. Mag. nat.*

Hist. (9) **16**: 644), apply the name to all specimens from Nyasaland but remark that specimens from Uganda and Lake Kivu " appear intermediate but may be placed with the typical form." A specimen from NORTH-EAST RHODESIA, Upper Kalungwisi Valley, 4200 feet, 4.ix.1908 (*S. A. Neave*), is also intermediate.

Charaxes imperialis imperialis Butler.

Not uncommon in UGANDA, west coast of L. Victoria, Malabigambo forest. It has previously been considered a rarity.

Charaxes pythodorus pallida Carpenter.

The type was described from TANGANYIKA TERRITORY, from Kazi-kazi on the Central Railway. Four other male specimens have been taken at the same locality by *B. D. Burtt*, 29.vii. and 20.viii.1932, and 16.iii.1933. It is possible that *pallida* is a dry-season derivative from *p. nesaea* Gr.-Sm.

Charaxes kahldeni Homeyer.

WEST UGANDA: Buamba (Semliki) Valley, 23–25.vii.1921 (*G. D. Hale Carpenter* and *C. A. Wiggins*), 4 ♂; v.1941 (*native collector for T. H. E. Jackson*), 1 ♂. SOUTH SUDAN: Mongalla Province, Torit, 4°5′N., 32°5′E., 25–29.v.1919 (*A. L. Kent-Lemon*), 2 ♀.

Charaxes subornatus minor Joicey & Talbot.

ANGOLA: 1873 (*Rogers*), 1 ♂. SUDAN: Bahr-el-Ghazal province, Congo–Nile divide, Bendere, 11.ii.1934 (*I. G. Owen*), 1 ♂.

Charaxes jahlusa kenyensis Joicey & Talbot.

KENYA COLONY: north-east shore of Lake Victoria, near Kisumu, xi.1903 (*A. Vincent*), 1 ♂. This record considerably extends the known range.

Charaxes lichas bebra Rothschild.

SOUTH SUDAN: Lotti, x.1938 (*T. H. E. Jackson*), 1 ♂. Same locality, 22.ix.1935 (*I. G. Owen*), 2 ♂, 1 ♀.

Charaxes etesipe Godart.

The specimens taken by A. Hodson in Abyssinia (south-west) were, I now think, incorrectly identified by myself (1935) as *abyssinicus* Rothschild: they are transitional to that form. Specimens from south Sudan (Bendere and Lotti) are of the typical form.

An interesting male from north ZULULAND, Sibangwana, Maputa, 6.vi.1938 (*H. W. Bell Marley*), was reported by Mr. F. Goodson to be " identical with the type of *e. tavetensis* Rothschild." No form of *etesipe* from Natal is represented in the collections at Oxford, Tring, or South Kensington, so this specimen considerably extends the known range of the species.

Charaxes etesipe form **caeruleotincta** ♀-form. n.

Certain females from Uganda appear to be undescribed: they are not represented in the collections of the British Museum (Natural History).

The spots on the fore-wing bluish-white and, in areas 1a, 1b, considerably suffused with blue around the margins. On the hind-wing pale blue almost completely replaces the usual creamy white of the discal band which is also broader than in *e. etesipe*.

UGANDA: Entebbe, 28.viii.1909 (*native collector for C. A. Wiggins*), 1 ♀, type. Paratype, same data, 29.viii.1909, 1 ♀.

Charaxes achaemenes Felder.

An apparently new point has arisen from a study of this species.

The females from West Africa and Abyssinia are alike in being separable from specimens from South and East Africa by the diagnosis given by Talbot for his new form *monticola* (1912, *Ann. Mag. nat. Hist.* (9) **16** : 645), viz. " Upperside with the spots of the fore-wing much paler than in the typical form. One specimen (Nigeria) is pale ochreous, the other (Sudan) is almost white." The Nigerian specimen came from " N. Nigeria, high plateau." The name *monticola* proves to be very misleading, for the paleness seems to be characteristic, not of mountains, but of western localities. Thus, in the Hope Department, a specimen from " Senegal " is so pale that it closely resembles its male: the pale brown marginal spots and the very light brown subapical row on the front wing distinguish it, but the discal spots are only faintly tinted with brown distally. Mr. F. Goodson kindly informs me that all the western females at Tring with reliable data are of this pale form: a specimen at Oxford from Sierra Leone is similar. Unfortunately there are at Oxford no females from the Sudan, but it will be noted that Talbot (*loc. cit.*) mentions one female from the Sudan as *monticola*.

SOUTH SUDAN: Nuba mountains, near Talodi, 19.iv. and 23.viii.1918 (*R. S. Wilson*), 2 ♂; Mongalla Province; Tali, 5°45′N., 30°45′E., 1500 feet, vi.1925 (*F. Moysey*), 1 ♂; near Loka, Mendepolo, 4°50′N., 30°55′E., xi.1933 (*I. G. Owen*), 1 ♂; west of Lafiet Mountains, Loriaju, 4°37′N., 32°48′E., 16.vi.1919 (*A. L. Kent-Lemon*), 1 ♂. UGANDA: Northern Province, East Madi, ix.1927 (*G. D. Hale Carpenter*), 1 ♂. KENYA COLONY: one hundred miles west-north-west of Mombasa, Dabida Mountain, 8.vii.1916 (*K. St. A. Rogers*), 1 ♀. *Ch. achaemenes* is evidently very scarce in Uganda, and has not been recorded by van Someren in Kenya, although Rothschild (1900 : 463) gives " Ndi, Brit. E. Afr." and " Kibwezi."

SOUTH AFRICA: Cape Province, near Victoria West, Three Sisters, i.–ii.1912, 1 ♂ and 1 ♀ in the Brodie Collection.

Charaxes baumanni Rogenhofer.

The only locality in SOUTH SUDAN from which it has been recorded is the Didinga mountains (Carpenter, 1928), where it was abundant. Its " restricted distribution " is discussed by van Someren and Rogers (1931 : 32), who say it does not occur in UGANDA. But it is not uncommon in the extreme west, *e.g.* in the Buamba (Semliki) Valley, vii.1921 (*G. D. Hale Carpenter* and *C. A. Wiggins*).

Charaxes guderiana Dewitz.

BELGIAN CONGO: Katanga, Kambove, 4500 feet, 6.vii.1907, 1 ♂, and West Lualaba district, Lower Lufupa, 3000–3500 feet, 5.xi.1907, 1 ♂ (*S. A. Neave*).

Charaxes guderiana ab. **burtti** ab. n.

♂. The usual blue colour is replaced by a tint with so little blue that it is better described as grey. The pale spots on the fore-wings are larger, more sharply defined and purer white along the margin.

Tanganyika Territory: 70 miles north of Kondoa Irangi, Kikori, 10.ix.1930 (*type*), 12.viii.1930 (*paratype*) (*B. D. Burtt*), 2 ♂. South-East Rhodesia: Gadzima, 3.viii.1895 (*G. A. K. Marshall*), 1 ♂, a little bluer than the type.

Charaxes etheocles Cramer ♂-f. *ephyra* Godart.

Uganda: Ripon Falls, October 1920, ex Brodie collection. It is of interest that this typically western form should occur so far to the east.

C. etheocles ♂-f. *lutacea* Rothschild.

South Sudan: Lotti, 22.ix.1935 (*I. G. Owen*), 1 ♂.

An interesting male from Gambia: vi.–viii.1903 (*H. L. Pryce*), is worth comment because of the paucity of specimens from that locality. It has the two subapical spots on the fore-wing characteristic of the more eastern *chanleri* Holland and *picta* Rothschild, though they are quite small. A very small bluish spot in the end of the cell and another at the base of area 6. The general colour dusky blackish-brown without blue suffusion. The margin of the hind-wing is greenish-brown from the anal angle to the external tail, and anteriorly to that is rust-coloured. This rust-colour is shown in *lutacea* but usually less developed. Submarginal lunules very small, merely dots, and the usual more proximal series is lacking. Under surface as in *lutacea*.

Mr. A. G. Gabriel kindly informed me that there are in the British Museum at South Kensington two males from "French Guinea" with similar reddish-brown marginal lunules on the upperside of the hind-wing, and Mr. F. Goodson also kindly wrote that at Tring there is a very similar specimen from "Gaboon." It would seem that this is another example of the eastern influence being continuous across the south of the Sahara to the west.

C. etheocles ♂-f. *catochrous* Staudinger.

This western form, common in Uganda, has not been received from the Sudan.

C. etheocles ♂-f. *chanleri* Holland.

Southern Nigeria: Lagos, Ogun river basin, ix.1899–viii.1900 (*H. Strachan*), 1 ♂; Isehi forest, 22.iv.1908 (*Gladstone*), 1 ♂. Chad Basin: vii.1908 (*R. Hottot*), 6 ♂. South Sudan: Equatorial province, Wau, 1.i.1939 (*J. F. Hope Simpson*), 1 ♂; Bahr-el-Ghazal Province, Bendere, 11.ii.1934 (*I. G. Owen*), 1 ♂; Mongalla Province, Imatong mountains, 12.ix.1919, 1 ♂, Torit, 20.v.1919, 1 ♂ (*A. L. Kent Lemon*). The males associated with the female form *violae* Butler already recorded (Carpenter, 1928) from the Nuba mountains are of this form. Somaliland (*Gillett*): 1 ♂. It seems that this typically eastern form extends to the west coast through the open country south of the Sahara.

C. etheocles ♂-f. *picta* Rothschild.

South Sudan: Lotti, 22.ix.1935 (*I. G. Owen*), 1 ♂. Uganda, Buamba (Semliki) Valley, vii.–viii.1921 (*G. D. Hale Carpenter* and *C. A. Wiggins*), 4 ♂; near Mengo, 23.v.1900 (*Mrs. Leakey*), 1 ♂.

C. etheocles ♂-f. *cytila* Rothschild.

Tanganyika Territory: Lulanguru, 17 miles west of Tabora, xi.1917 (*G. D. Hale Carpenter*), 4 ♂ of small size. Belgian Congo: Katanga, Upper Lufira river, 3500 feet, vi.1907 (*S. A. Neave*), 1 ♂. "Angola": 1 ♂.

A specimen from the TRANSVAAL: Marieps mountains, 25°35′S., 30°50′E., 4500 feet, 29.iii.1931 (*H. C. Kenway*), has a somewhat different facies from ordinary *cytila*. Dr. Karl Jordan, F.R.S., pronounced it to be a form of *etheocles* from its genitalia, but its aspect suggests *ethalion* Boisduval in some points. It is dull black without bluish reflection. There are no spots on the fore-wings, and the submarginals on the hind-wings are weakly developed, the marginal markings faintly greenish, and the tails short, blunt, and broader than usual. The black markings of the under surface are sharper, and the general effect darker, than in *cytila*. A long series of this might establish it as a local race.

C. etheocles ♀-f. *vansomereni* Poulton.

The type and two paratypes come from UGANDA, near Kampala, which is interesting since this form belongs to the more eastern group of females whereas the Kampala neighbourhood is strongly western. This locality is linked with the more usual locality to the east of Lake Victoria by a specimen from Busoga, 10.vi.1921 (*C. H. Lankester*). SUDAN, Imatong mountains, 5000–8000 feet, x.1938 (*T. H. E. Jackson*), 1 ♀.

C. etheocles ♀-f. **ethalionoides** form. n.

This has been discussed and figured by van Someren and Rogers (1932 : 167, Plate CXX, fig. 2) but not named, and I propose for it the name *ethalionoides*.

The striking bluish-white of the broad bands on the front- and hind-wings, and the complete separation of the distal from the proximal white spots on the front wing distinguish this form, and give it a great resemblance to the female of *ethalion* Boisduval, from which it can be distinguished by the greater width of the white discal bands on the under surface.

The TYPE will be the specimen illustrated by van Someren and Rogers, from KENYA COLONY, coastal zone. Paratypes, in Hope Department. Kenya Colony, Sagalla mountain, *circa* 100 miles west-north-west of Mombasa, 3500 feet, 6.iv.1915, and Dabida mountain, *circa* 100 miles west-north-west of Mombasa, 11.iii.1915 (*K. St. A. Rogers*), 2 ♀.

Charaxes nichetes nichetes Grose-Smith.

UGANDA: Lake Victoria, Bugalla Island, 1912 (*G. D. Hale Carpenter*), 5 ♂. It is of interest that the only specimens from Uganda that I have seen are of this western race, and of more interest that in the large collections made by T. H. E. Jackson from the Malabigambo forest (Katera) on the west coast of Lake Victoria opposite Bugalla (which is here separated from the mainland by a channel only two miles wide at its narrowest part) *nichetes* is not represented, nor has it been sent from the large forests in western Uganda. It seems to be a relict, for the vegetation of the Sese Islands shows that there was at one time continuity with the West African rain forest.

Charaxes zelica zelica Butler.

SOUTH SUDAN: Kideppo valley, between Torit and Katire, 3500 feet, 23.v.1932 (*I. G. Owen*), 1 ♂. This is the western race: specimens from UGANDA, even from its western forests (Buambá valley and Budongo), are all of the eastern race *depuncta* Joicey & Talbot, as far as Jinja.

Charaxes laodice Drury.

South Sudan: Bahr-el-Ghazal province, Congo–Nile divide, Bendere, 2800 feet, 29.iv.1936 (*I. G. Owen*), 1 ♂.

Finally, the geographical relationships of the *Charaxes* known from south Sudan may be tabulated as follows :—

Western	Eastern
castor castor Cramer	*hansali baringana* Rothschild
lucretius Cramer	*baumanni* Rogenhofer
numenes numenes Hewitson	*etheocles* ♂ f. *chanleri* Holland
achaemenes monticolor Talbot	,, ♂ f. *picta* Rothschild
zelica zelica Butler	,, ♂ f. *vansomereni* Poulton
laodice Drury	,, ♀ f. *violae* Butler
	ethalion Boisduval

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CORRECTION OF A MISTAKE OF LONG STANDING CONCERNING THE IDENTITY OF *ATYLOTUS PLEBEIUS* FALLEN (DIPTERA, TABANIDAE)

By J. E. Collin, F.R.E.S.

Since 1858 when Loëw (*Verh. K.K. zool.-bot. Ges. Wien* **8** : 596) wrote of *A. plebeius*, " Recht auffallend ist die Länge der schwarzen Haare, welche sich am hinteren Augenrande befinden.—Die schwedischen Exemplare gleichen den unserigen vollständig," the name *plebeius* Fallen has been used for a species with very long (at least in the male) postocular ciliation.

When Goffe in 1930 (*Trans. ent. Soc. S. England* **6** : 103) recorded the occurrence of *Atylotus plebeius* Fallen in Britain he followed this usually accepted interpretation of that species, and mentioned a form *aethereus* Bigot 1862 (a mistake for 1892) which differs from the type male in having " the back of the head without long and distinct pubescence."

In 1939 Oldroyd (*British Bloodsucking Flies* : 98) referred more precisely to a fringe of black, curved and very long hairs on the upper portion of the back of the head in the male *plebeius*, but in the female (and he had seen only females from Britain) this fringe was stated to be pale and shorter; the fact that this did not agree with Brauer's statement (1880, *Denk. Akad. Wiss. Wien* **42** : 167) that the postocular ciliation in the female *plebeius* was " viel kürzer als beim Manne, aber dicht, schwarz," was not noted.

Since 1939, males have been captured in the same locality in Cheshire as the females seen by Goffe and Oldroyd, and through the kindness of Mr. H. Britten I have recently been able to examine both sexes and to find that they both have a very short pale postocular fringe. The male is indistinguishable from the type male of *aethereus* Bigot in Bigot's collection, and from an unnamed male in Kowarz's collection from Asch in Bohemia, considered by Kowarz distinct from *plebeius*, presumably because of the absence of the long postocular fringe. The type of *aethereus* Bigot was seen by Kröber in 1922 and identified (1924, *Arch. f. Naturgesch.* **89** (*A*) 12 : 114) as the same as *plebeius* var. *calvus* Szilady.

Finally, among some unidentified Tabanidae in the Verrall Collection there is a male *Atylotus* taken by Dr. T. A. Chapman at Saeterstoen (Norway) in 1898 closely resembling *aethereus* Bigot but with a remarkably long blackish postocular fringe, much longer hairs on basal antennal joints, rather shorter and stouter palpi and knob of halteres entirely brown. This must, without doubt, represent the *plebeius* Fallen of Loew, and a species distinct from *aethereus* Bigot.

Neither Fallen nor Zetterstedt made any reference to a long postocular fringe in their *Tabanus plebeius* or any other species of that genus, but when Verrall examined the Scandinavian collections in 1908 he made notes upon various type specimens, and an examination of these notes fortunately supplied the required information.

Under notes on Fallen's type-collection in Stockholm he wrote : " *T. plebejus* ♂ has long haired eyes, but *no* postocular fringe (or only about as long as pubescence of eyes)."

Under notes on Zetterstedt's collection at Lund he wrote : " *Tab. sublunaticornis* 1 ♂ I should not hesitate to put as *T. plebeius* ♂, but basal joints of

antennae have long blackish pile, and back of occiput *very* long fringe, both of which are missing in Zetterstedt's *plebeius* ♂."

Again under notes on specimens in the General Collection at Stockholm: "*Tab. plebeius* ♂ has scarcely any tuft behind vertex, but *sublunaticornis* has extraordinary tuft and fringe," noting at the same time that one of the three males under *sublunaticornis* had *no* fringe or tuft behind eyes.

The differences between the males of these two species are much too striking for one to be even a form or subspecies of the other, much less a synonym, as has been suggested. It therefore appears certain, with regard at least to the male, that the name *plebeius* Fallen has been incorrectly applied to Zetterstedt's species *sublunaticornis*, and that our British species is the true *plebeius* Fallen, with *aethereus* Bigot and probably *calvus* Szilady as synonyms.

Book Notice.

The Sphecidae of Madagascar. G. Arnold. Pp. 193, text illust. 8vo. Cambridge (Trustees of the National Museum of Southern Rhodesia), 1944 (*recte* 1945). Price £1 15*s.* 0*d.*

This monograph of the Sphecidae of Madagascar is based on a collection belonging to the Paris Museum but the work was done by the Director of the National Museum of Southern Rhodesia.

The basis of the classification of Madagascan Sphecidae is Saussure's monograph, published in 1892, when 81 species were recorded. Since then only 8 species had been added to the list until the present work, which includes the description of 88 new species and several new genera.

The text follows the form usual in a monograph, commencing with a key to the species in each genus, followed by the description of the individual species. Previously described species are not redescribed unless corrections are necessary for identification. 140 text-figures are given to aid identification.

It is noteworthy that while 85% of the species are endemic, no endemic genera (and only a single subgenus) are recorded.

The title-page of this very attractively produced book is dated "1944", but a small-type footnote reads "Issued May 1945". It is difficult to find a good reason for the use of a false date on the title page of any book which is important nomenclatorially.

THE LINNAEAN NAMES OF INDO-AUSTRALIAN RHOPALOCERA. PART 4. THE CHINESE BUTTERFLIES IN THE LINNAEAN COLLECTION OBTAINED BY PETER OSBECK IN 1751

By A. Steven Corbet, D.Sc., Ph.D., F.R.I.C., F.R.E.S.

(*British Museum, Natural History.*)

In Part 2 : 21,[1] when discussing the Chinese butterflies figured in the First and Supplementary parts of Clerck's *Icones Insectorum rariorum*, I stated that: "It appears that these Chinese specimens in the Linnaean collection were obtained, almost certainly, by Peter Osbeck, who visited Whampoa, near Canton, from 25.viii.1751 to 6.i.1752 and stayed at West Java for a day or two on the journeys out and home. It is worth mentioning, however, that there is no evidence that Linnaeus had any Javanese insects in his collection when he wrote the *tenth edition*." These statements can now be substantiated and expanded.

Recently, I had an opportunity of studying Osbeck's diary of his voyage to Canton in 1750–1752. The original was published in Swedish at Stockholm in 1757. A German translation by J. G. Georgi, entitled "Reise nach Ostindien und China, nebst O. Toreens Reise nach Suratte und C. G. Ekebergs Nachricht von der Landwirtschaft der Chineser," appeared from Rostock in 1765; this edition was revised by Osbeck before publication. To the English translation by J. R. Forster, which was published in London in 1771, were added two appendices "Faunula Sinensis" and "Flora Sinensis" compiled, presumably, by Forster: in these were listed the animals and plants then known from China.

Osbeck travelled to China in the capacity of chaplain on board the Swedish East India Company's ship *Prinz Carl*, leaving Gothenburg on 27 November, 1750, and reaching Whampoa, near Canton, on 25 August, 1751. On the outward voyage, ten weeks were spent at Cadiz and some collecting expeditions to Puerto de Sancta Maria yielded a specimen of the Papilionid *Zerynthia rumina* (Linnaeus), as well as larvae which eventually produced adults of *Colias hyale* (Linnaeus). A few days were spent in the vicinity of Prince Island, off the west coast of Java, on both the outward and return voyages, but it appears that no serious insect collecting was done on either occasion; in fact, of his visit to New Island (west Java) on 20 January, 1752, Osbeck writes: "Several butterflies flew about me; but my eyes were fixed upon the *Flora*." On the island of Linting, in the Canton stream, on 22 August, 1751, Osbeck collected a butterfly which he described as *Papilio lintingensis* and which can only be identified as *Precis hierta* (Fabricius) (*vide* Fox, 1900, *Science* **12** : 718).

The *Prinz Carl* spent over four months at Whampoa, beginning the journey home on 4 January, 1752. It is evident from his diary that Osbeck's interest was centred in the flora rather than the fauna of the places he visited and his insect collecting was quite casual. He mentions finding some living *Attacus atlas* (Linnaeus), which he called *Phalaena fenestrata*, in a merchant's shop in Canton; these specimens he pinned but all except the wings were devoured by a bat which came in through the open window at night.

[1] The previous parts in this series are: Part 1, 1941, *Proc. R. ent. Soc. Lond.* (B) **10** : 8–16; Part 2, 1941, *loc. cit.* (B) **10** : 17–27; Part 3, 1942, *loc. cit.* (B) **11** : 91–94.

A special interest attaches to the Cantonese butterflies obtained by Osbeck and now preserved in the Linnaean collection in the possession of the Linnean Society of London, for these probably represent the oldest collection of Chinese butterflies extant. Moreover, many of them have become the type specimens of the commoner oriental species of butterflies and it would have been appropriate had their collection been invested with romance. Such, however, was not the case. These classical specimens, contained in an open box, were purchased by Osbeck in September 1751 from a Chinese vendor for half a piastre! It appears from Osbeck's diary that similar small collections of butterflies were frequently on sale in Canton, each containing "about ten or twelve sorts, but many of each sort." In the German edition,[2] Osbeck gave a list of the species thus obtained by him in the neighbourhood of Canton: this list was modified slightly by Forster in the English edition. Osbeck's catalogue contains a few obvious errors, *deiphobus tryphe*, *erippe* (corrected to *euippe* in the English edition), *troilus* and *philavtodes* (corrected to *philoctetes* in the English edition) not being Chinese, while *demoleon* (omitted from the English edition) is a *nomen nudem* and entirely unconnected with *Papilio demolion* Cramer, 1776. Of the remaining sixteen species listed by Osbeck and which have been identified with certainty, there are genuine Linnaean specimens of all of them in the Linnaean collection, and all except *agamemnon*, *orithya* and *demoleus* are low-set on long, black, headless pins (*vide* Part 3 : 91). With the exception of *c-aureum* and *aonis*, all are marked in Linnaeus' own copy of *Systema Naturae, Edition x*, as being in his own collection while *c-aureum* and *aonis* (as *lemonias*) are so marked in Linnaeus' copy of *Edition xii* as being in his collection. Moreover, it will be noted that, with the exception of *orithya*, all the true Chinese species in the list are figured in the First and Supplementary parts of Clerck's *Icones*.

The butterflies obtained at Canton by Osbeck according to the German edition "Reise nach Ostindien und China" (pp. 269–270) are as follows:—

Papilio helena [*sic*, = *helenus*]. [Figured in Clerck, I, t. 13, fig. 2.]
deiphobus. [Not Chinese: see note below.]
dissimilis. [Figured in Clerck, I, t. 16, fig. 2.]
similis. [Figured in Clerck, I, t. 16, fig. 3.]
tryphe. [Not Chinese: see note below.]
agamemnon. [Figured in Clerck, Suppl., t. 10, fig. 1 and t. 6, fig. 2 (as "*aegistus*").]
c-aureum. [Figured in Clerck, Suppl., t. 4, fig. 3.]
orythia. [*sic*, = *orithya*.]
pammon. [Figured in Clerck, I, t. 14, fig. 2.]
aonis. [Figured in Clerck, Suppl., t. 7, fig. 2 (as "*lemonias*").]
leucothoë. [Figured in Clerck, Suppl., t. 5, fig. 4. Under "*leucothoë*" Linnaeus confused two different species, *Parathyma perius* (Linnaeus) and *Neptis hylas* (Linnaeus).]
demoleus. [Figured in Clerck, I, t. 6, fig. 1.]
paris. [Figured in Clerck, I, t. 13, fig. 1.]
midamus. [Figured in Clerck, Suppl., t. 8, fig. 2.]
mineus. [Figured in Clerck, Suppl., t. 7, fig. 3.]
erippe. [Not Chinese: see note below.]
demoleon. [*Nomen nudum*: not known to what species the name refers.]

[2] I have not had an opportunity of examining the original Swedish edition.

Papilio troilus. [Not Chinese : see note below.]
almana. [Figured in Clerck, Suppl., t. 4, fig. 2 (dry-season form) : t. 5, fig. 3 represents the wet-season form which Linnaeus named *asterie*.]
plexippus. [Figured in Clerck, Suppl., t. 5, fig. 1.]
chrysippus. [Figured in Clerck, Suppl., t. 5, fig. 2.]
philavtodes. [Not Chinese : see note below.]

A few observations can be made regarding the names of non-Chinese species included in Osbeck's list.

P. deiphobus. This is an Amboinese species of *Papilio* which is figured in Clerck, II, t. 25, fig. 1. It bears a superficial resemblance to the male of *Papilio memnon agenor* Linnaeus, a common oriental butterfly of which there is an uncoloured figure in Clerck, Suppl., t. 8, fig. 1, and which is represented in the Linnaean collection. It seems probable that Osbeck's record of *P. deiphobus* refers to a male of *P. memnon agenor*.

P. tryphe. Probably a mis-spelling for *trite*, which is a Central and South American species of *Phoebis* and with which Osbeck may have confused males of *Catopsilia crocale* (Cramer), as this latter species had not been described at this time.

P. erippe. Correctly spelt *euippe* in the English edition. This name designates a species of *Colotis* from tropical Africa of which the male is figured in Clerck, II, t. 40, fig. 5. The only Cantonese Pierid which bears any resemblance to it is the male of *Ixias pyrene* (Linnaeus) but this latter butterfly has the upperside yellow instead of white, although it has a red subapical band on the fore-wing somewhat as in *C. euippe*.

P. troilus. It is difficult to guess which Cantonese butterfly Osbeck may have mistaken for this North American species of *Papilio*. It could hardly have been *pammon* (that is, the male of *Papilio polytes* Linnaeus), for this name is included in Osbeck's list.

P. philavtodes. This was corrected to *philoctetes* in the English edition, which name refers to a tropical American butterfly in the Satyrid genus *Antirrhaea*, which is figured in Clerck, II, t. 30, fig. 3. It is not very dissimilar from the common oriental Satyrid *Melanitis leda* (Linnaeus), of which there are uncoloured figures in Clerck, Suppl., t. 7, fig. 1, and which is represented in the Linnaean collection.

From the foregoing considerations it can hardly be doubted that the Cantonese butterflies obtained by Osbeck are, in fact, those in the Linnaean collection which, in many cases, are the types of Linnaean names. There is reason to believe, however, that the list published by Osbeck is incomplete. There are further 16 Cantonese species[3] in the Linnaean collection, of which 10 are marked in Linnaeus' copy of *Edition x* as being in his collection and 2 more are so marked in *Edition xii*; 12 of these 16 species are represented by specimens low-set on long, headless " Cantonese " pins, and 7 of them are figured in Clerck's *Icones*, Part I or Supplementary Part, while a further species (*glaucippe*) is figured in Part II.

It has been mentioned already (Part 1 : 9) that the illustrations in Part II of the *Icones* are of specimens in the Museum of Queen Ludovica Ulrica but *glaucippe* is the only species from south-east China figured in this Part. It is clear

[3] That is, considering each Linnaean name as representing a species, although in some cases the names designated the opposite sex or a different form of a species described under another name.

from Aurivillius' work, however, that the Queen's Museum contained many butterflies from China, many of which I regarded as Linnaean name-types, and it now appears probable that many, if not all, of these were Cantonese butterflies obtained by Peter Osbeck.

Olof Toreen, another Swedish pupil of Linnaeus, was at Whampoa at the same time as Osbeck, having officiated in the same capacity on the Swedish East India Company's ship *Der Gothische Löwe* (" Gothic Lion "). There is, however, no mention in his letters to Linnaeus of any insect collecting in China and there appears to be no evidence that he sent any insects home from there, although he referred to a small collection of insects sent to his former teacher from India.

Papilio lintingensis Osbeck, 1765.

Reise nach Ostindien und China: 148; ♀, Linting Island, near Macao.

It was pointed out previously (Part 2 : 19) that Linnaeus' original description of *Papilio oenone* in *Edition x* undoubtedly refers to the African butterfly *Precis clelia* (Cramer), while the figures cited by Linnaeus represent the oriental species *Precis hierta* (Fabricius). It is evident that Linnaeus confused the two but the name must be reserved for the African species.

Osbeck described *Precis hierta* from Macao under the name of *Papilio lintingensis* and this name has priority over that of Fabricius which was published in 1798. A female specimen figured in colour in Clerck's *Icones*, Suppl., t. 4, fig. 4 (as " *oenone* ") agrees closely with an individual in the Linnaean collection labelled " oenone fem." in Linnaeus' writing. In any case, there is every reason for supposing that the Linnaean butterfly is the one taken by Osbeck on Linting, for there is no doubt regarding its provenance, in which case it must be regarded as the holotype of *Papilio lintingensis* Osbeck.

The Nymphalid species now known as *Precis hierta* (Fabricius) has been referred to by this name almost invariably for the last sixty years and it is unfortunate that such a well-established name should be replaced by one which has not been used since Osbeck's day. Under the International Rules, however, no other course is open but to restore the name *lintingensis* for this species, for it is quite improbable that the International Commission on Zoological Nomenclature would agree to a suspension of the rules in order to invalidate Osbeck's name.

Amendments to Previous Papers.

Two small amendments are required to previous papers in this series. In Part 1 : 16 it was concluded that, as there was no reference to " M.L.U." and as the species was not marked as being in the Linnaean collection, the type of *glaucippe* could only be the figure in Edwards' *Nat. Hist. Birds* cited by Linnaeus. A specimen of *glaucippe*, low-set on the usual " Cantonese " pin, was found in the Linnaean collection. Doubtless, it was one of the butterflies obtained by Osbeck, although not so listed, and it must be considered the type of *Hebomoia glaucippe* (Linnaeus).

In Part 3 : 92 it should have been indicated that the specimen of *aonis* or *lemonias* under discussion was low-set on a long, black, headless pin similar to those used for the other Cantonese butterflies.

NEW OR LITTLE-KNOWN SPECIES OF EXOTIC TIPULIDAE (DIPTERA) III

By Professor Charles P. Alexander, F.R.E.S.

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The preceding part under this title was published in 1944, *Proc. R. ent. Soc. Lond.* (B) **13** : 74–80. The material discussed herewith is from South Africa, almost all being from Southern Rhodesia, where they were collected by my long-time friend, the late Mr. Alexander Cuthbertson (1901–1942), to whom we are vastly indebted for much of our knowledge of the Tipulidae of that country. Through Mr. Cuthbertson's wishes, the types of the novelties are preserved in my collection, the second specimen of a species in the British Museum (Natural History), the third in the Rhodesian Museum. The species described at this time are in addition to the large collection of Tropical African Tipulidae being reported upon separately and based primarily on the extensive series of these flies collected by the late Dr. F. W. Edwards and his colleagues of the British Museum Ruwenzori Expedition.

Dolichopeza (Dolichopeza) cuthbertsoniana sp. n.

General coloration of thorax brown, without clearly-defined pattern; antennae with scape and pedicel yellow, flagellum brown; femora and tibiae brown, the tips very narrowly darker brown; tarsi snowy white, the basitarsi with about the central third infuscated; wings with a faint greyish tinge, the stigma and broad seams over the anterior cord and *m-cu* dark brown; cell M_1 about five times as long as its petiole; *m-cu* approximately or nearly its own length before the fork of M; basal abdominal tergites bicoloured, the outer segments, including hypopygium, more uniformly blackened; male hypopygium with the ninth tergite produced medially, on either side with a narrow blackened flange that is directed backward.

Male. Length about 10–11 mm.; wing 11 mm.; antenna about 2·5 mm.

Female. Length about 11·5–12 mm.; wing 11 mm.

Frontal prolongation of head and the palpi brown. Antennae relatively short; scape and pedicel yellow, flagellum brown; flagellar segments subcylindrical, the longest verticils a little less than the segments, unilaterally distributed on the upper faces of the segments. Front and anterior vertex silvery white, the posterior portions of head brown, sparsely pruinose.

Pronotum brownish-yellow. Mesonotum chiefly medium to darker brown, without clearly defined pattern; praescutum virtually glabrous, the scutum and mediotergite with abundant, relatively long, black setae; mediotergite testaceous brown, paler than the pleurotergite. Pleura pale brownish-yellow to testaceous-yellow, unpatterned. Halteres elongate, brownish-black, the base of stem narrowly pale. Legs with coxae and trochanters pale yellow; femora and tibiae pale brown, the tips narrowly and indistinctly darker brown; basitarsi white at both ends, with about the central third infuscated; remainder of tarsi white; claws small and simple. Wings with a faint greyish ground; stigma and broad seams over anterior cord and *m-cu* dark brown; extreme wing-tip infuscated; discal region before cord and beyond stigma somewhat more whitened; veins brown, the prearcular and costal veins, particularly *Sc*, somewhat paler. No macrotrichia in cells of wing. Venation : R_{1+2} entirely atrophied; *Rs* short and transverse, subequal to or a little shorter than the basal section of R_{4+5}; forks of media deep, cell M_1 about five times its petiole; *m-cu* far before fork of M, in cases fully its own length; cell *2nd A* broad.

Abdominal tergites bicoloured, the broad basal rings and very narrow posterior and lateral borders dark brown, the remainder of the posterior ring of each segment yellow; basal sternites more uniformly yellow; outer three or four segments, including hypopygium, more uniformly blackened. Male hypopygium with the tergite strongly produced medially into an oval darkened lobe; on either side of this with a strong blackened flange directed backward, this narrow and microscopically roughened. Outer dististyle a narrow pale lobe, the longest setae about one-half as long as the style. Inner dististyle a broadly flattened blade, the beak a little produced beyond the much wider lower beak, both subtruncate at their tips.

Holotype, ♂, Chirinda Forest, Melsetter District, Southern Rhodesia, altitude 3600 feet, November 1930 (*Cuthbertson* No. 2799). *Allotopotype*, ♀. *Paratopotypes*, 2, in British Museum (N.H.); *paratypes*, 1 ♂, Vumba Mountains, Southern Rhodesia, November 1932; 1 ♂, same place, March 1935 (*Cuthbertson*); in Rhodesian Museum. Still further specimens in British Museum, sent to Edwards by Cuthbertson.

I take great pleasure in naming this fly after the collector, Mr. Alexander Cuthbertson, to whom I am greatly indebted for many TIPULIDAE from Scotland and Rhodesia. The species is entirely different from other described African members of the typical subgenus, including the aberrant *Dolichopeza* (*Dolichopeza*) *malagasya* Karsch, of Madagascar, and the two Tropical African species described by Speiser and Riedel as being members of the genus *Scamboneura* Osten Sacken. The only close ally of the present fly is a still different larger species from the Ruwenzori collections to be described elsewhere (Edwards No. 2).

Habromastix mosselensis sp. n.

General coloration grey, the praescutum with four brown stripes; antennae (male) elongate, approximately three-fourths the length of wing; flagellar segments beyond the first black, long-cylindrical, with a dense pale pubescence and scattered black spinose setae; halteres elongate; legs brown, the outer tarsal segments black; wings unusually narrow, the length exceeding five times the greatest width, greyish subhyaline, the stigma, narrow costal border and a seam along vein *Cu* brown; cell 1*st* M_2 elongate; *m-cu* close to fork of M_{3+4}; male hypopygium with caudal margin of tergite with a deep V-shaped notch; outer dististyle elongate triangular, pale, without spinous points as common in the genus.

Male. Length about 10 mm.; wing 10 × 1·8 mm.; antenna about 7·5 mm.

Frontal prolongation of head relatively long, only a little shorter than remainder of head, dark brownish-grey above, slightly paler beneath; nasus lacking; palpi brownish-black. Antennae (male) elongate, approximately three-fourths as long as wing, 12-segmented; scape, pedicel and first flagellar segment light brown, pruinose, the succeeding segments brownish-black to black; scape and pedicel short; first flagellar segment relatively short-cylindrical, with numerous setigerous punctures; succeeding segments elongate-cylindrical, with short black spinous setae over much of the length of flagellar segments two to six, inclusive, on the outer segments these fewer and more appressed; all flagellar segments with an additional pale erect pubescence. Head grey; vertical tubercle relatively narrow; anterior vertex broad, nearly four times the diameter of scape.

Pronotum brown, sparsely pruinose. Mesonotum chiefly brownish-grey, the praescutum with four poorly-delimited darker stripes; remainder of notum dark brown, pruinose. Pleura grey, the dorsopleural membrane buffy yellow. Halteres elongate, stem obscure yellow, knob infuscated. Legs with the coxae brown, paler outwardly, the surface pruinose; trochanters obscure yellow; remainder of legs brown, the outer tarsal segments passing into black; tibial spurs elongate; claws simple. Wings unusually narrow, as shown by the measurements; ground colour greyish subhyaline, the costal

border, involving cells *C* and *Sc*, with the stigma, light brown; a comparable brown seam behind vein *Cu*; *Rs* more vaguely seamed with brown; veins brown. Macrotrichia of veins behind *R* relatively sparse, including a series on distal section of R_{4+5} and fewer on outer sections of veins M_1 to M_3, inclusive; some trichia on distal section of Cu_1 but none on M_4, *Rs* or its anterior branch. Venation: Sc_2 ending about opposite midlength of *Rs*; R_{2+3} long, exceeding *Rs*; cell M_1 short-petiolate, the petiole longer than *m*; cell 1*st* M_2 elongate; *m-cu* close to fork of M_{3+4}.

Abdomen dark brown, pruinose; hypopygium chiefly brown, the tergal lobes paler. Male hypopygium with the tergite large, its caudal margin with a deep V-shaped notch, the lateral lobes broadly obtuse. Basistyle only moderately elongate, simple. Outer dististyle an elongate-triangular yellow blade, gradually narrowed to the very slender obtuse tip, provided with erect pale setae but without spinous points. Inner dististyle of about the same length but much broader, slightly wider opposite midlength, thence a very little narrowed to the obtuse tip.

Holotype, ♂, Mossel Bay, Cape Province, May 1921 (*R. E. Turner*); British Museum 1921–248, in the British Museum (N.H.).

Habromastix mosselensis is quite distinct from the few other African species that have been referred to this genus, being best distinguished by the very narrow wings. It should be understood that the generic assignment, based primarily on the antennae, is more or less provisional and that a revision of the more generalised Tipuline generic groups that centre about *Longurio* Loew and *Ozodicera* Macquart is certain to produce some drastic changes and re-assignments of species.

Longurio (Longurio) piger sp. n.

General coloration of body dark brown; antennae 12-segmented, short; nasus lacking; vertical tubercle entire, very high and conspicuous; knobs of halteres dark brown; femora and tibiae brownish-yellow, the tips narrowly blackened; wings relatively broad, medium brown, the costal border narrowly dark brown; veins unusually glabrous; vein R_{1+2} preserved; abdominal tergites and sternites yellow, with a broad central black stripe on each, these much expanded on the outer segments, the apex of abdomen, including hypopygium, blackened; male hypopygium with the inner dististyle narrowed on outer fourth, the expanded blade with a narrow blackened flange that bears nine or ten strong teeth.

Male. Length about 10 mm.; wing 12 mm.; antenna 2 mm.

Frontal prolongation of head relatively long, nearly two-thirds the remainder of head; no nasus, the region provided with a few long black setae; prolongation dark brown above, a trifle paler on ventral surface; palpi black. Antennae (male) relatively short; scape and pedicel obscure yellow, flagellum brownish-black; 12-segmented, the flagellar segments simple, subcylindrical, gradually decreasing in length outwardly, the first segment about one-third longer than the second; terminal segment subequal in length to the penultimate; verticils scattered, shorter than the segments. Head dark brown, the front, sides of vertical tubercle and the orbits very narrowly and inconspicuously paler; vertical tubercle very high, entire.

Pronotum dark brown. Mesonotum medium brown, the surface more or less polished, without stripes; setae sparse and inconspicuous; scutum and scutellum pale brown, postnotum paler, more yellowish. The entire thoracic notum appears subtranslucent, as though the body contents were drawn away from the body chitin and this, presumably, has somewhat altered the normal appearance. Pleura brownish-yellow, without setae. Halteres with stem yellow, knob dark brown. Legs with the coxae and trochanters yellow; femora and tibiae obscure brownish-yellow, the tips narrowly blackened; tarsi black. Wings relatively broad, medium brown, the costal border narrowly darker brown, involving cells *C* and *Sc* but not *R*; prearcular field slightly paler brown; outer radial field, a narrow border around the wing and the veins beyond the cord seamed with paler brown; vague

obliterative brightenings before the stigma and across the base of cell 1*st* M_2; veins brown. Veins virtually glabrous, beyond the cord with a few scattered trichia on outer section of R_{4+5}. Venation: Sc_1 preserved as a short spur; free tip of Sc_2 weak but evident; R_{1+2} preserved; petiole of cell M_1 about one-half longer than m; cell 1*st* M_2 narrowed outwardly, widest opposite the fork of M_{3+4}, the latter subequal in length to m; cell 2*nd A* wide.

Abdominal tergites and sternites yellow, the more basal segments clearer yellow; on the second and succeeding segments with a conspicuous black median stripe, this more widened and conspicuous on outer segments; apex of abdomen, including hypopygium, uniformly blackened. Male hypopygium with the tergite relatively small, its caudal portion emarginate but pale and membranous, the borders not clearly defined; outer half of tergite with abundant long black setae. Basistyle moderately long and slender. Inner dististyle broad on proximal three-fourths, thence strongly narrowed, on face of blade with an elongate marginal flange that bears about nine or ten strong teeth. Outer dististyle smaller, appearing as a long dusky lobe that arises just before midlength of the inner or major style.

Holotype, ♂, Chirinda Forest, Southern Rhodesia, altitude 3600 feet, November 1930 (*Cuthbertson* No. 2814).

Longurio (*Longurio*) *piger* is quite different from the other described species of the genus, being most similar to the South African *L.* (*L.*) *melanoptera* (Alexander) yet quite distinct. The latter species has the antennae even more reduced, at least in the subapterous female sex.

Limonia (Limonia) praetor sp. n.

Size large (wing, male, about 24 mm.); thoracic dorsum black, the praescutum abruptly brick-red, with a more or less distinct median dark line on central portion; thoracic pleura extensively blackened; halteres of male with the stems elongate; legs black; wings of male with apex very obtuse; *Rs* in male longer than its anterior branch; wings in male with stigma yellow, in female large and darkened; abdominal tergites orange; sternites orange with blackened lateral areas; subterminal segments of male blackened; hypopygium yellow.

Male. Length about 20 mm.; wing 24·5 mm.

Female. Length about 14–19 mm.; wing 15–21 mm.

Rostrum and palpi black. Antennae black, the outer flagellar segments a trifle paler; flagellar segments cylindrical, the terminal one very long, much exceeding the penultimate; longest verticils unilaterally arranged, very long, exceeding twice the length of the segment. Head blackish, grey pruinose, especially behind; anterior vertex (male) reduced to a narrow strip that is only about as wide as a single row of ommatidia; front hairy.

Pronotum black, grey pruinose. Mesonotal praescutum reddish-brown to brick red, with a triangular blackened median area on cephalic portion; lateral border of praescutum behind the pseudosutural foveae more or less darkened in male, immaculate in female; scutum, scutellum and postnotum uniformly blackened, sparsely pruinose, contrasting conspicuously with the brightened praescutum. Pleura black dorsally, the colour involving the pleura and pleurotergite; ventral pleurites reddened in male, uniformly blackened in female; in the female, the pteropleurite and meron conspicuously pale. Halteres much longer in male than in female, stem yellow, knob blackened. Legs with the coxae brown in the male, in female yellow with the fore pair blackened on the basal portion; trochanters yellow; remainder of legs black, those of male broken. Wings of the sexes differing conspicuously in pattern and venation; in male, wings very obtuse at apex; ground colour brownish-yellow, the prearcular and costal fields, with the broad wing apex, more saturated yellow; a restricted dark pattern, including small dark brown areas at arculus, Sc_1, Sc_2, origin of *Rs*, R_2 and apex of free tip of Sc_2; cord and outer end of cell 1*st* M_2 very narrowly and insensibly seamed with brown; other longitudinal veins more or less distinctly seamed with pale brown; similar longitudinal washes in cells R, R_1 and R_3; veins dark brown,

brownish-yellow in the flavous portions. Venation: *Sc* elongate, Sc_1 ending a short distance before fork of *Rs*, Sc_2 near its tip; *Rs* exceeding in length its anterior branch; free tip of Sc_2 lying far distad of R_2; *m-cu* close to fork of *M*; vein *2nd A* sinuous. In the female, the shape of the wing is normal for the genus; ground colour very pale yellow, the costal portion feebly brightened; stigma dark brown, large and conspicuous; cell *Sc* darker than cell *C*; narrow brown seams at origin of *Rs*, along cord and outer end of cell *1st* M_2; wing-tip narrowly darkened; restricted dark seams along veins *Cu* and *2nd A*; veins pale brown, those in costal field a little brightened. Venation: *Sc* long, Sc_1 ending opposite fork of *Rs*, the latter much shorter than its anterior branch; *m-cu* near fork of *M*.

Abdominal tergites orange, the basal segment darkened; sternites orange, the lateral borders narrowly but conspicuously blackened, in the female tending to form basal triangles; in male, a narrow triangular median dash at posterior border of sternites, larger on the more basal segments; male with seventh and eighth segments blackened; hypopygium yellow. Ovipositor chiefly yellow, the hypovalvae chiefly blackened. Male hypopygium of the type common in the subgenus *Libnotes*; rostral prolongation of ventral dististyle very slender, gently curved; two rostral spines at base of prolongation, arising from a common tubercle, subequal in length and gently curved; lobule of style terminating in two very elongate setae. Ovipositor with cerci very small, terminating just beyond the tips of the stout hypovalvae.

Holotype, ♂, Chirinda Forest, Southern Rhodesia, altitude 3600 feet, December 1935 (Cuthbertson No. 4316). *Allotopotype*, ♀, November 1930 (Cuthbertson No. 2816); British Museum (N.H.). *Paratopotype*, ♀, with the holotype; Rhodesian Museum.

This very striking fly has no close ally so far described from the Ethiopian Region. In its general appearance it comes closest to *L.* (*L.*) *loveridgei* Alexander but is quite distinct. The male has the halteres so much longer and the wing form, venation and pattern so different from the condition in the female that I would have felt obliged to consider them as distinct species if the unusual body coloration was not the same in both sexes. As it is, the possibility still is not excluded that two species are involved. The hypopygium has a structure that is found in several species that have been referred by Edwards and me to the subgenera *Limonia* Meigen, *Libnotes* Westwood and *Laosa* Edwards.

Limonia (Limonia) bethae sp. n.

General coloration of praescutum deep orange, the posterior sclerites of notum and most of the thoracic pleura brownish-black, with a clear silvery grey pubescence, the latter forming a very broad pleural stripe; halteres whitened; legs pale brown, the tarsi light yellow; wings with a strong brownish tinge, the short-oval stigma darker brown; *Sc* long, cell *1st* M_2 about as long as vein M_3 beyond it; male hypopygium with the outer dististyle provided with abundant delicate setulae; ventral dististyle fleshy, the rostral prolongation slender, with two short spines from the summit of a conspicuous tubercle; gonapophyses with a strong seta before the mesal-apical lobe; aedeagus at apex with two large divergent lobes.

Male. Length about 5·5 mm.; wing 6·8 mm.

Head dark grey; antennae and mouthparts broken.

Anterior portion of mesonotum, including most of praescutum, deep orange, the posterior-median portion of praescutum and the posterior sclerites of notum abruptly brownish-black, with a grey pruinosity; lateral portions of praescutum vaguely tinged with darker. Pleura chiefly brownish-black, with a clear silvery grey pruinosity to form a broad stripe over most of the pleura; dorsopleural region infuscated; ventral pleurites, including the sternopleurite, obscure yellow. Halteres whitened, the knobs scarcely darkened. Legs with the coxae and trochanters pale yellow, the fore and middle coxae weakly darkened at bases; femora and tibiae obscure brownish-yellow to pale brown, the tarsi paling to light

yellow, only the outer segments darkened; claws long and slender, with a single elongate spine. Wings with a strong brownish tinge, the prearcular and narrow costal field more whitened; stigma subcircular to short-oval, darker brown; veins brown. Venation: *Sc* long, Sc_1 ending about opposite three-fourths *Rs*, Sc_2 at its tip; *Rs* long, about one-half longer than R_{2+3}; free tip of Sc_2 and R_2 almost in transverse alignment; branches of *Rs* generally parallel to one another, slightly more decurved and approximated at their outer ends; inner end of cell R_3 lying proximad of either cell R_5 or 1*st* M_2, the latter large, subrectangular, about equal in length to vein M_3 beyond it; *m* and basal section of M_3 subequal, the former more arcuated; *m-cu* subequal to distal section of Cu_1, placed just beyond the fork of *M*; cell 2*nd A* relatively narrow.

Abdominal tergites brownish-black, basal sternites a little more brightened. Male hypopygium of the type of *Dicranomyia*. Ninth tergite transverse, narrowed outwardly, the posterior border rather shallowly and narrowly emarginate. Basistyle with the ventromesal lobe simple, provided with long setae. Dorsal dististyle a strong powerful rod, a little dilated near its tip, thence produced into a long straight spine; outer surface of style with abundant setulae. Ventral dististyle large and fleshy, its area about twice that of the basistyle; rostral prolongation slender; spines two, relatively short, placed at apex of a conspicuous tubercle at the base of prolongation; spines a little longer than their basal tubercle and a little more than twice the distance from the tubercle to the outer end of prolongation. Gonapophysis with mesal-apical lobe stout; on outer margin before apex with a single seta. Aedeagus large, at apex divided into two large divergent lobes.

Holotype, ♂, Umtali, Vumba Mountains, Southern Rhodesia, altitude 5000 feet, November 1940 (*Cuthbertson*).

I am very pleased to name this species after Mrs. Alexander Cuthbertson (Margaret Beth Cuthbertson), who assisted her late husband on many of his collecting trips in Rhodesia. The present fly is quite distinct from the other regional members of the subgenus. From those that have the ventral dististyle of the hypopygium of the so-called "*Dicranomyia* type," as is the case in this species, including the South African *Limonia* (*Limonia*) *capicola* (Alexander) and allies, the present fly is readily told by all details of coloration of the body and wings, and in the structure of the male hypopygium.

Limonia (Limonia) bethae contexta subsp. n.

Male. Length about 4·8 mm.; wing 4·9 mm.

Characters much as in typical *bethae* sp.n., differing especially in the small size and details of coloration.

Legs with the yellow apices more extensive, involving the tarsi and the distal third to nearly half of the tibiae. Wings with *Sc* shorter, Sc_1 ending opposite three-fifths *Rs*, Sc_2 near its tip; *Rs* shorter; *m* more arcuated; cell 2*nd A* narrower. Male hypopygium with the setae of tergite more sparse, there being only from six to seven on either side; in the typical form from twelve to thirteen. Basistyle with ventromesal lobe shorter and stouter. Ventral dististyle with the rostral prolongation slightly longer and more slender. Gonapophysis without a seta, this being replaced by a small acute marginal spinous point.

Holotype, ♂, Momjipome, Cameroon, in bamboo swamp, 24 January, 1938 (*Jacob A. Reis*).

Helius (Helius) dugaldi sp. n.

Mesonotal praescutum buffy yellow with three brown stripes; posterior sclerites of notum dark brown; thoracic pleura brown with a yellowish longitudinal stripe; halteres yellow; femora obscure yellow, the tips narrowly whitened, preceded by a broader subterminal dark brown ring; wings whitish, patterned with brown; abdomen of male with tergites dark brown, entirely enclosing a yellow discal marking; abdomen of female trans-

versely banded with yellow and brown; male hypopygium with a single dististyle, narrowed on outer fourth and bearing a short black spinulose lobe.

Male. Length about 6 mm.; wing 4·5 mm.

Female. Length about 6·5–7 mm.; wing 5–5·5 mm.

Rostrum relatively long, about one-half longer than the remainder of head, black throughout; palpi black, more than one-half the length of rostrum. Antennae with scape and pedicel black, flagellum pale brown; antennae of male broken, of female about equal in length to the rostrum; proximal flagellar segments short and crowded, the outer ones short-cylindrical to oval, the verticils longer than the segments. Head dark grey; anterior vertex narrow.

Pronotum buffy yellow, darker on sides. Mesonotal praescutum buffy yellow laterally, the disk with three conspicuous dark brown stripes; scutal lobes similarly darkened, the median region paler; scutellum and postnotum dark brown. In the female, the lateral praescutal stripes are less clearly indicated. Pleura dark brown, with a conspicuous yellow or yellowish-white longitudinal stripe extending from behind the fore coxae to the base of abdomen, passing below the halteres; dorsopleural membrane yellow. Halteres yellow. Legs with the fore coxae infuscated, middle coxae darkened basally, their tips broadly yellow, posterior coxae yellow; all trochanters obscure yellow; femora obscure yellow, the tips narrowly whitened, preceded by a broader dark brown ring; tibiae and tarsi pale brown; claws simple. Wings whitish, the prearcular field and costal border narrowly more yellow; a relatively heavy and conspicuous brown pattern, including the somewhat darker large oval stigma; paler washes at bases of cells *R* and *M*, continued for more than two-thirds the length of the main stem of *Cu*; a rectangular dark area at origin of *Rs*, extending completely across cell *R* in the male, somewhat less extensive in female; narrow seams over cord and outer end of cell 1*st* M_2; a major cloud over tip of anterior branch of *Rs*, in male reaching vein R_{4+5} behind; wing tip and apical border narrowly seamed with brown, most extensive in outer end of cell R_3; veins yellow, darker in the patterned areas. Venation: Sc_1 ending about opposite five-sixths the length of *Rs*, Sc_2 near its tip; *Rs* angulated at origin; cell R_3 at margin more extensive than cell R_2; inner end of cell 1*st* M_2 arcuated, more conspicuously so in female where the cell is more elongated; *m-cu* opposite or beyond midlength of cell 1*st* M_2.

Abdomen of male differently patterned from that of female; tergites beyond the first two completely margined by brown, enclosing a broad triangular yellow area, leaving small anterolateral pale triangles on each segment; sternites apparently simply bicoloured, yellow with broad pale brown posterior borders; segments eight and nine uniformly blackened, the proximal portions of the basistyles a little paler. In female the segments simply bicoloured, tergites light yellow with less than the outer half dark brown, the areas clearly delimited transversely, sternites similarly patterned but the yellow bases much narrower, the outer two-thirds of the individual segments dark brown; ovipositor with the valves dark-coloured, elongate, especially the very slender cerci. Male hypopygium with the so-called tergal spines appearing as pale elongate flattened blades, narrowed gradually to acute spinous points, the surface at near midlength with a few scattered setulae. Basistyle relatively stout, simple. A single dististyle of peculiar formation, the basal three-fourths stout, subcylindrical, blackened, the distal fourth narrower, flattened and much paler, the tip obtuse; on ventral margin of style at point of narrowing with a strong black lobe that bears a few short spinous points at and near tip. Aedeagus simple, straight, the basal portion subtended by broad lateral flanges.

Holotype, ♂, Umtali, Vumba Mountains, Southern Rhodesia, altitude 5400 feet, November 1940 (*Cuthbertson*). *Allotopotype*, ♀, with the type; British Museum (N.H.). *Paratypes*, 2 ♀, Chirinda Forest, Southern Rhodesia, altitude 3600 feet, in grass near stream, November 1930 (*Cuthbertson* Nos. 2810, 2854); 1 in Rhodesian Museum, 1 in author's collection.

Named after Master Dugald Cuthbertson, young son of Alexander and Margaret Beth Cuthbertson. Although superficially resembling the species of the subgenus *Rhamphidioides* Alexander, *Helius* (*Rhamphidioides*) *alluaudi* (Riedel) and *H.* (*R.*) *venustissima*, the present fly is entirely distinct in the venation and in all details of coloration of the body and wings. The differences in coloration of the abdomen in the two sexes is noteworthy.

NOTE ON THE CLASSIFICATION OF THE BRITISH SPECIES OF "BLACK APHIDES" (HEMIPTERA, APHIDIDAE)

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The object of this note is to state briefly the present position regarding the nomenclature and synonymy of the "black aphides," and to draw attention to some of the outstanding problems. Much work needs to be done before the position can be clarified but, in the meantime, it is hoped that the following summary of the better known literature will help anyone interested in the problems involved in a study of this group of aphides.

In a broad sense, the "black aphides" may be regarded as a single polyphagous species *Aphis fabae* Scopoli, plus a number of species which are not polyphagous. This has led to a fairly complex pattern of synonymy; a fact which will be readily understood when it is realised that the polyphagous species has a number of hosts in common with the non-polyphagous species, and that many of the taxonomic characters now in use have been made available only by comparatively recent advances in microscopical technique.

In view of the economic importance of *A. fabae*, and the need for control measures which may depend on the treatment of the host plants of this species, a very clear understanding of its biology and systematics is necessary.

In the first place it may be of interest to outline briefly the historical background.

Historical Note.

In the earliest literature black aphides were described from a number of host plants, and, following the Linnean principle, named accordingly. Thus, by the time that Kaltenbach (1843) published his monograph, a considerable number of species had been described. It was probably at this time that the seeds of confusion were sown. In addition to the known species, Kaltenbach described a number of new ones; and realised the existence of a polyphagous species which he called *Aphis papaveris* Fabricius. It is interesting to compare a list of the species described by Kaltenbach with Table 1.

Species described by Kaltenbach	Host Plant
A. papaveris Fabricius	Polyphagous (29 plants named)
Synonyms :—	
A. thlapseos Schrank	
A. fabae Scopoli	
A. atriplicis Fabricius	

A. aparines Schrank	
A. armata Hausmann	
A. rumicis L.	*Rumex* spp. *Arctium minus* *Achillea ptarmica*
A. viburni Scopoli	*Viburnum opulus*
A. euonymi Fabricius	*Euonymus europaeus*
A. laburni Kaltenbach	*Cytisus laburnum* *Spartium scoparium*
A. craccae L.	*Vicia cracca*
Synonym :—	
A. viciae Fabricius	
A. galii Kaltenbach	*Galium mollugo*
A. ilicis Kaltenbach	*Ilex aquifolium*
A. hederae Kaltenbach	*Hedera helix*
A. genistae Kaltenbach	*Genista tinctoria* *Genista anglica*
Synonym :—	
A. genistae Scopoli	
A. euphorbiae Kaltenbach	*Euphorbia cyparissias*

This is very similar to the list of species accepted by the most recent workers : in fact, the changes have been due mainly to new methods of classification, and to the application of the principle of priority in nomenclature. It was during the ensuing period that confusion increased. There must have been many reasons for this, but the following argument may help to explain it.

First, it may be said that the older workers regarded the host relationship as specific, so that, in spite of their very close morphological similarity, the black aphides associated with different plants had to be regarded as distinct. However, the idea of polyphagous species would be likely to bring changes, and where morphological differences were slight, a tendency would arise to lump the species together. The position as viewed by Kaltenbach (1843) has been shown; the extreme lumping is illustrated by Walker (1852), who only recognised four species : *A. rumicis* L., *A. euonymi* Fabricius, *A. viburni* Scopoli (wrongly attributed to Fabricius), and *A. hederae* Kaltenbach. This list included 22 synonyms of *A. rumicis* L. Later authors (*e.g.* Koch (1857), Buckton (1879)) did not lump the species to anything like the same extent. Without going into a detailed discussion of the views of these authors, it may be said that until recent times the polyphagous species continued to be known as *A. papaveris* Fabricius to German workers, and as *A. rumicis* L. to the British.

Secondly, the discovery by Osborne & Sirrine (1894) that the black aphis on *Euonymus* migrated to *Rumex* and other plants, followed by the confirmation of this migration in America and Europe, led to further confusion (*e.g.* Theobald (1912)). At this time the life-cycle of *A. fabae* Scopoli was not properly understood, so that this new knowledge led to further lumping, and loss of species. The existence of two, possibly three, species associated with *Euonymus europaeus*, was overlooked; and it was not realised that there were distinct species such as *A. rumicis* L. and *A. craccae* L. which oviposited on other plants.

The position in 1921, when Börner published the results of his first studies, may be very briefly summed up as follows : There are two groups of "black aphides," one a large group which may be referred to as the "*fabae* group" (see

Table 1, Franssen (1930)), and the other consisting of a number of species which are readily distinguished from the first. It is to the "*fabae* group" that most attention has been paid, and it was in this group that the greatest confusion had developed.

Extensive references are given by Theobald (1912) which, with those given more recently by the workers referred to below, form a comprehensive bibliography of the "black aphides."

Recent History.

During the past 25 years, attempts have been made to clarify the position of *A. fabae*, both as regards the existence of possibly distinct species, and as regards the existence of special varieties or biological strains. Some of the leading opinions are summarised in Table 1, where, in addition to *A. fabae*, a number of non-economic species are dealt with because many of them have been, or are liable to be, confused with *A. fabae*; and because they help to complete the story. The names used by each author are placed opposite to his name, but when the same name is used by another author it is not re-entered, but represented by a vertical line, except in the lower half of the table where it is necessary to re-enter the names in order to illustrate the lumping of Theobald and the splitting of the other authors. A broken line is used when the species is not mentioned by the author in question.

The following is a synopsis of the main works.

Börner (1921) rediscovered the existence of a black aphis peculiar to *Rumex* spp., and decided to regard it as *A. rumicis* L; and at the same time retained *A. papaveris* Fabricius for the polyphagous species, confirmed *A. viburni* Scopoli as a distinct species, and described a new species *A. philadelphi* Börner, which lives on *Philadelphus* spp., and is transferable to *Euonymus* spp., *Viburnum* spp., and various weeds.

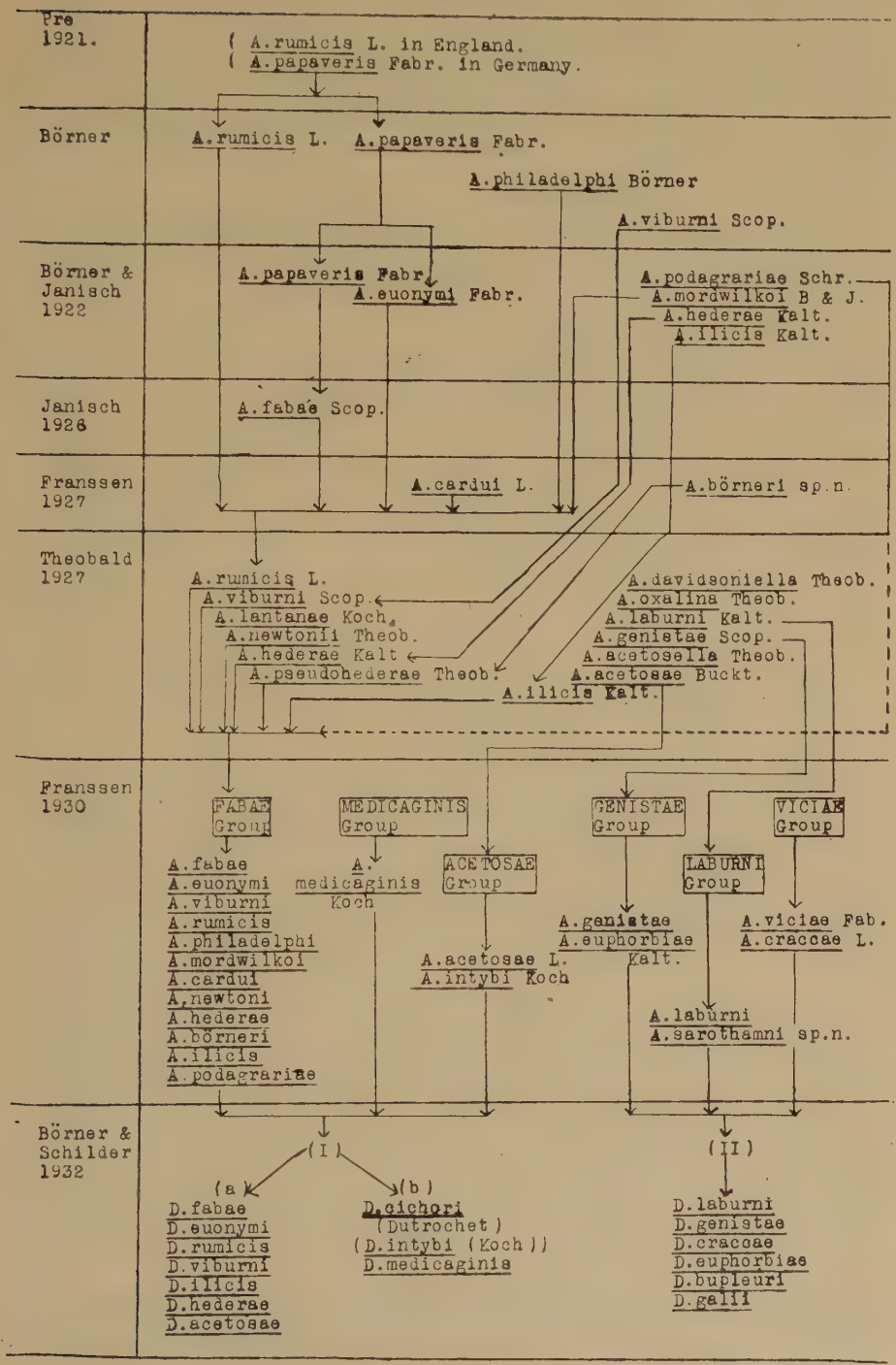
Börner & Janisch (1922) elaborated the views of Börner (1921), and split *A. papaveris* into a long-haired species *A. papaveris* Fabricius, and a short-haired species *A. euonymi* Fabricius, each of which species is said to overwinter on *Euonymus* spp., but to have different summer host preferences. *A. hederae* Kaltenbach, on ivy, is added to the group; and *A. ilicis* Kaltenbach is suggested as a possibly distinct species, as is *A. podagrariae* Schrank, which is holocyclic on *Aegopodium podagraria*. These authors describe a further new species *A. mordwilkoi*, which overwinters on *Viburnum opulus*, and migrates to *Arctium* spp. in the spring.

Janisch (1926) gives a detailed account of the black aphides in which, on grounds of priority, the name *A. fabae* Scopoli is substituted for *A. papaveris* Fabricius.

Franssen (1927), working along very similar lines to those of Janisch, regards *A. cardui* L. as a distinct species; and describes a new species, *A. börneri*, which, like *A. hederae* Kaltenbach, is holocyclic on ivy. This is the species described as *A. pseudohederae* by Theobald (1927). These species are very similar morphologically, but Franssen (1931) describes several minor differences which taken individually might be held to come within the range of variation of either species. However, *A. börneri* Franssen has apterous males, as opposed to alate males in *A. hederae* Kaltenbach, and the oviparous females of the latter have more strongly swollen hind tibiae than those of the former species.

Theobald (1927) did not accept the views of the preceding workers regard-

TABLE 1.


Pre 1921.
A.rumicis L. in England.
A.papaveris Fabr. in Germany.
Börner
A.rumicis L.
A.papaveris Fabr.
A.philadelphi Börner
A.viburni Scop.
Börner & Janisch 1922
A.papaveris Fabr.
A.euonymi Fabr.
A.podagrariae Schr.
A.mordwilkoi B & J.
A.hederae Kalt.
A.ilicis Kalt.
Janisch 1926
A.fabae Scop.
Franssen 1927
A.cardui L.
A.börneri sp.n.
Theobald 1927
A.rumicis L.
A.viburni Scop.
A.lantanae Koch.
A.newtoni Theob.
A.hederae Kalt
A.pseudohederae Theob.
A.davidsoniella Theob.
A.oxalina Theob.
A.laburni Kalt.
A.genistae Scop.
A.acetosella Theob.
A.acetosae Buckt.
A.ilicis Kalt.
Franssen 1930
FABAE Group
MEDICAGINIS Group
ACETOSAE Group
GENISTAE Group
VICIAE Group
LABURNI Group
A.fabae
A.euonymi
A.viburni
A.rumicis
A.philadelphi
A.mordwilkoi
A.cardui
A.newtoni
A.hederae
A.börneri
A.ilicis
A.podagrariae
A. medicaginis Koch
A.acetosae L.
A.intybi Koch
A.genistae
A.euphorbiae Kalt.
A.viciae Fab.
A.craccae L.
A.laburni
A.sarothamni sp.n.
Börner & Schilder 1932
(I)
(II)
(a)
(b)
D.fabae
D.euonymi
D.rumicis
D.viburni
D.ilicis
D.hederae
D.acetosae
D.cichori (Dutrochet)
(D.intybi (Koch))
D.medicaginis
D.laburni
D.genistae
D.craccae
D.euphorbiae
D.bupleuri
D.galii

ing the splitting up of the polyphagous species, and retained the name *A. rumicis* L. However, he described a new species *A. davidsoniella*, which is almost certainly the same as Börner's *A. rumicis* L. Theobald described several other black species, the relationships of which are shown in Table 1.

Franssen (1930) placed the black aphides in a number of major groups based on the presence or absence of wax development in the living aphides, and the relative proportions of the cornicles and cauda. To these groups he assigned the species indicated in Table 1.

Börner & Schilder (1932), in dealing with the economic species of *Aphis* L. as a whole, put the classification of the " black aphides " on a new footing based on larval chaetotaxy. In the first place *Aphis* L. is split up into *Aphis* L., comprising *A. sambuci* L. and *A. clematidis* Koch; and *Doralis* Leach, containing the rest of the known species. This distinction was previously made by Börner (1930): it involves the presence of pleural hairs on the meso- and metathorax of newly born larvae of *Aphis*, and their absence in *Doralis*. In the other characters used the distinctions are not sharp.[1] *Doralis* is split up into two main groups depending on the development of wax, which may be sparse (Group 1) or abundant (Group 2); group 1 is further divided into 1a and 1b, according to the chaetotaxy of the anal plate in newly born larvae. These authors include *A. philadelphi* and *A. mordwilkoi* in the synonymy of *A. fabae*, and do not consider that a good enough case exists for the retention of *A. cardui* L. em. Franssen.

Lambers (1934) briefly summarises the views of Börner, Janisch and Franssen with regard to *A. rumicis* L, but he prefers to regard *A. euonymi*, *A. philadelphi* and *A. mordwilkoi* as forms of *A. fabae*. He also states that Theobald's material of *A. lantanae* Koch is either *A. viburni* or *A. fabae*.

Jones (1942a) describes *A. rumicis* L and gives a detailed comparison with *A. fabae*, and (1943) describes a new species *A. cognatella* which, as far as is known, is holocyclic on *Euonymus europaeus*.

Recently Jacob (unpublished) has demonstrated the existence of a distinct species, *A. armata* Hausmann, living on wild foxgloves.

For the purposes of these notes the classification of Börner & Schilder, rather than that of Theobald, is adopted. One outstanding feature of this approach is that the problems raised by the black species are common to a number of species which are not black. In fact, it is held here that the possession of black pigment is not necessarily an indication of close relationship; and this is borne out by Börner & Schilder, whose group 1 (see Table 1) includes such non-black economic species as *A. rhamni* B.d.F. and *A. idiae* v.d.G. It may be argued that the use of larval characters is an unnecessary complication, but this is not held to be a real difficulty. Improved methods in the laboratory techniques of maceration and mounting, introduced in recent years, remove most of the real difficulties in the way of critical microscopical examination.

The continental workers have paid considerable attention to the biology and host-plant preferences of *A. fabae*, and its closest relations; and this is an additional reason for regarding their work as a foundation. Both Janisch (1926) and Franssen (1931) give extensive lists of host plants in addition to extremely detailed morphological comparisons, but Franssen's classification seems to be unnecessarily complicated.

[1] In the Aphidini the dorsal hairs tend to be arranged in a definite pattern. In general there are two median longitudinal rows, and on each side a lateral row, and an intermediate row of pleural hairs. Each segment may, or may not, have a complete set of hairs, and there may be additional rows. The final arrangement gives characters of generic and specific rank.

Nomenclature is another subject which requires clarification. When Börner decided to call the species peculiar to *Rumex* spp. *A. rumicis* L., he was following the spirit of Linnaeus, as well as taking the only reasonable view. This principle requires very careful consideration, as it is fundamental to the elucidation of the black aphides. The fact that the polyphagous *A. fabae*, in addition to other black species, also occurs commonly on docks makes it quite impossible to decide to which species the Linnaean epithet refers.

Discussion of the British Species.

The following species have been collected by the author in England and Wales :—

Species	Summer host plant
A. fabae Scopoli	Extremely polyphagous. Beans and sugar-beet may be regarded as typical.
A. rumicis L.	*Rumex* spp.
A. viburni Scopoli	*Viburnum opulus* L.
A. ilicis Kaltenbach	*Ilex aquifolium* L.
A. hederae Kaltenbach	*Hedera helix* L.
A. cognatella Jones	*Euonymus europaeus* L.
A. armata Hausmann	*Digitalis purpurea* L.
A. laburni Kaltenbach	*Laburnum vulgare* Presl.
A. craccae L. / *A. viciae* Fabricius	*Vicia cracca* L.
A. galii Kaltenbach	*Galium mollugo* L.
?*A. medicaginis* Koch	*Ulex europaeus* L.
?*A. sarothamni* Franssen	*Cytisus scoparius* Link

It is not intended to deal with the above species in any great detail, or to give a key which at most would be only provisional, but certain well-marked distinctions are indicated below, and are summarised in Table 2.

A. ilicis, *A. hederae* and *A. cognatella* are all brown species, and as far as is known, are all holocyclic on the given hosts. *A. fabae* shares its winter host with *A. cognatella*, but in mixed colonies; it is only the males of these species which are likely to be confused. Mounted specimens are more difficult to distinguish, but careful observation of the living colonies should suffice where these species are concerned.

A. rumicis (see Jones, 1942a) is distinguished by having apterous males, and oviparous females with unswollen hind tibiae. It causes very marked leaf curl, which helps to distinguish it from *A. fabae*, when the two species occur together. Mounted specimens are fairly readily recognised by the marked reticulation of the cuticle, and by the degree of chitinisation.[2]

Reticulation of the dorsal cuticle of the abdomen is characteristic of this group of aphides, but there is considerable variation in its intensity, both as between species and as between individuals. On the whole, however, the reticulation is faint in *A. fabae* and conspicuous in most specimens of *A. rumicis* (apterous viviparous females). There does not seem to be any well-marked

[2] These notes refer to specimens treated by Roepke's (1924) method. This consists of gentle maceration in lactic acid in a water bath, followed by clearing in phenol, and mounting in Berlese's fluid. Stored specimens are preserved in a mixture of equal parts of 70% alcohol and 70% lactic acid.

TABLE 2.

Some outstanding features of the species of black aphides to which reference has been made.

Species	Colour of living apt. v. ♀	Development of wax in apt. v. ♀	Chitinisation	Reticulation	Gynopara or sexupara	Male	Hind tib. of ovip. ♀
A. fabae	Black	Sparse	Sparse [3]	Faint [3]	Alate gynopara	Alate	Very swollen
A. viburni	Black	Sparse	Sparse	Faint	?	Apterous	Not swollen
A. armata	Black	Sparse	Sparse	Faint	Apterous sexupara	Alate	Not swollen
A. ilicis	Brown	Sparse	Sparse	Faint	?	Alate	Feebly swollen
A. hederae	Brown	Sparse	Sparse	Faint	Apterous sexupara	Alate	Swollen
A. cognatella	Brown	Sparse	Sparse	Faint	Apterous sexupara	Alate	Not swollen
A. rumicis	Black	Sparse	Medium variable	Very marked	Apterous sexupara	Apterous	Not swollen
A. laburni	Black	Abundant	Fairly heavy	Very marked	Apterous sexupara	Alate	Swollen
A. craccae	Black	Abundant	Fairly heavy	Very marked	Apterous sexupara	Alate	Not swollen
A. medicaginis	Black	Fairly plentiful	Fairly heavy	Very marked	Apterous sexupara	Alate	Swollen
A. sarothamni	Black	Fairly plentiful (Franssen)	Fairly heavy (Franssen)	?	?	Alate (Franssen)	Swollen (Franssen)
A. galii	Black	Abundant (Börner)	Sparse	? None [4]	?	?	?

[3] Vary with host plants, *e.g.*, some specimens from thistles have conspicuous reticulation.
[4] *i.e.*, in few specimens available.

gradation of this character between species; broadly speaking, it is more marked in species such as *A. rumicis*, *A. craccae*, *A. laburni* and *A. medicaginis* (sensu Thomas & Jacob (1940)), and less well marked in most of the remaining species. Chitinisation shows a definite relationship to reticulation, in that chitinised patches are limited in size and shape to a number of complete cells of the network, so that where the reticulation is faint it is accentuated by the presence of even a slight amount of chitin. Heavy chitinisation is generally associated with conspicuous reticulation. (See Table 2.)

A. viburni is characterised by being holocyclic on *Viburnum opulus* (and possibly on other species of *Viburnum*), and by having apterous males. The very long body and antennal hairs are conspicuous in mounted specimens.

A. armata is more difficult to distinguish than any of the other species, and an added difficulty is that *A. fabae* quite readily takes to foxgloves in transference experiments. However, both observation and experiment have shown that this is a distinct species. The oviparous females have unswollen hind tibiae, and viable eggs are laid on foxgloves. So far this species has only been found in the mountainous districts of the Lake District and North Wales.

A. laburni, *A. craccae* (of which *A. viciae* may or may not be a synonym), and *A. galii* are all characterised by more or less copious wax development in the living apterous viviparous females. These species are readily distinguished microscopically, and cannot easily be confused with the economic species.

A further species occurs on *Ulex europaeus*, and has been called *Doralis medicaginis* (Koch) by Thomas & Jacob (1940). However, Franssen (1931) gives *Medicago* and *Trifolium* spp. as the hosts of this species; in view of the element of doubt this species is not included in the present discussion. *A. sarothamni* Franssen is another species about which there is insufficient evidence definitely to say whether it occurs in this country.

Discussion.

The outstanding problems lie in the consideration of the polyphagous species *A. fabae*, and some of these are referred to below.

(1) As stated above, Börner & Janisch (1922) split up *A. papaveris* Fabricius into a long-haired species *A. papaveris* Fabricius and a short-haired species *A. euonymi* Fabricius. In part, their evidence is based on the range of host plants observed both in the field and in transference experiments. They state that *A. papaveris* was not found on *Rumex* spp., and could not be bred upon them; whereas *A. euonymi* occurs on *Rumex crispus*. Janisch (1926) does not include *Rumex* spp. in the host-plant list of *A. fabae*, but Franssen (1930) includes *R. crispus*, *R. domesticus*, *R. hydrolapathum*, and *R. obtusifolius* in his list of the host plants of this species. This conflict of evidence is not easy to explain, but it may be due, in part, to the inherent difficulties in the recognition of these species. At the same time, it is worth pointing out that experience shows that a number of black aphides will readily feed and reproduce on *Rumex* spp.; so that these plants are not at all well suited to critical biological work on this group. However, there are other differences which may be useful, e.g. *A. euonymi* is said to occur on *Solanum nigrum* and *Polygonum convolvulus*, whereas *A. fabae* does not. Jones (1942b) found that in England *A. fabae* readily took to *R. obtusifolius*. So that the problem which remains to be solved in this country may be summed up: Does, or does not, *A. fabae* as we know it in this country consist of two species? A careful search for really critical host plants should help to elucidate this problem.

To this may be added a problem of nomenclature. Fabricius's (1775) description of his *A. euonymi* includes the statement "corpus nigrum, abdomine fusco" which, as the description applies to the alata, might very well apply to *A. cognatella* Jones. In addition Fabricius states that the larvae of *A. euonymi* are reddish-brown ("Iuniones fuscae"), which strengthens the author in his suspicion that *A. cognatella* Jones may be a synonym of this species. Subsequently Fabricius (1794) repeats this description. Schrank (1801) describes *A. euonymi* Fabricius as a black species but, in the opinion of the author, Kaltenbach (1843) describes *A. cognatella* Jones, and Buckton (1879) probably describes a mixture of species as Jones (1943) suggests. Both Kaltenbach and Buckton record the species on *Euonymus europaeus* in August, which supports the present suggestion. If it is a fact, as the author believes, that *A. cognatella* Jones is a synonym of *A. euonymi* Fabricius, then a new name will have to be found for the short-haired species described by Börner, Janisch and Franssen.

(2) Franssen (1927) includes *Philadelphus coronarius*, *Deutzia crenata* and *Viburnum opulus*, with *Euonymus* spp. as winter hosts of *A. fabae* in Holland; whereas Börner's view seems to be that this species only overwinters on *Euonymus* spp. In England black aphides occur on all these plants, but it remains to be seen whether *A. philadelphi* and *A. mordwilkoi* can be distinguished; *A. fabae* is known to occur on *Viburnum opulus*. For the present the best course would probably be to follow Lambers (1934), and consider *A. philadelphi* and *A. mordwilkoi* to be specialised races of *A. fabae*. However, every effort should be made to solve this problem.

(3) An important problem is raised by the black aphis which in some seasons overwinters as parthenogenetic colonies on *Euonymus japonicus*, and by the colonies which overwinter on winter and volunteer beans in S.W. England. It is important that the part which these aphides play in the infestation of summer crops should be thoroughly understood.

(4) Observations in fields suggest that there may be a distinct race occurring on *Cirsium arvense*, which host has frequently been seen to be colonised when beans and beet were not. In the field, migrants arrive at about the same time as on beans and beet, and are indistinguishable. In addition beans and beet have been colonised when thistles were not. It has also been experienced that *A. fabae* will not transfer at all readily to thistles (*C. arvense*). This is a minor problem which requires investigation.

Doubtless there are numerous other problems of practical and scientific interest, which require to be investigated, and those already mentioned should serve to draw attention to many more.

Acknowledgements.

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DESCRIPTION OF A NEW ANTHRIBID BEETLE FROM TRANSVAAL (COLEOPTERA)

By H. E. Karl Jordan, Ph.D., F.R.S., F.R.E.S.

The Imperial Institute of Entomology has submitted to me for identification three male and one female specimens of an Anthribid which was found boring in fruit of *Encephalartos* sp. (Cycadaceae) at Potgietersrust, Transvaal, by Miss Verdoorn in October 1944. The species is new and of great taxonomic interest and possibly of some economic importance. It is particularly distinguished by the rounded prothorax being devoid of a carina and bearing in the middle of the side a conical tooth. The combination of these two characters is unique in Anthribidae. The lateral tooth is evidently homologous with the end of the lateral carina of other Anthribids and corresponds to the long tooth of *Mecocerus principalis* Jord. 1928 (Tonkin), the only other Anthribid in which such a prominent side-tooth occurs. The *Mecocerus*, however, has the carina fully developed and is also otherwise far removed from the new African insect, which, though related to the South African genus *Holophloeus* Jord. 1928, is so different in its morphological detail that it undoubtedly represents a new genus.

Apinotropis gen. n.

Below medium size, with the pubescence of the upperside and the surface-structure coarse. Rostrum as broad at apex as long, slightly narrowed behind antenna, upperside flattened, with a shallow median depression, in which there is a thin median carina that does not extend to apex; no other carina; sinus of apical margin broad and shallow; punctures large, their interspaces narrow, forming a net; genal scar effaced by the coarse punctuation; labium feebly sinuate, the insertion of the palp distant from the apical margin of the labium; in male the labiophore with a glossy tubercle each side of the median sinus. Frons about as broad as the apex of the rostrum. Eye circular, lateral, small, with the anterior margin somewhat straightened, its longitudinal diameter about one-third the length of the rostrum. Scrobe of antenna foveiform, not extending on to underside; interspace between scrobe and eye wider than the eye. Antenna of large male reaching beyond middle of elytra, segment I short, the proportional length of the other segments being 19, 25, 26, 33, 37, 37, 31, 36, 11, 12, width of III 10, of IX 18, X transverse, XI a little broader than long; in smaller males the antenna shorter, and III slightly the longest of III to VIII, IX less than twice as long as broad; in female the antenna reaching to base of prothorax, II as long as III, III to VIII diminishing in length, VII less than twice as long as broad. Pronotum broader than long, strongly rounded at sides, nearly as narrow at base as at apex, dorsally flattened. Elytra longer than broad, flattened above, with the sides parallel, apical area short and rather abruptly curved downwards, basal margin incurved from shoulder to shoulder, punctures of stripes large. Pygidium vertical, about twice as broad as long. Prosternum punctate, inclusive of posterior lateral depressed area; procoxae contiguous, anterior intercoxal process narrow and pointed; mesosternal process about as long as broad, apically rounded; interspace between meso- and metacoxae much wider than mesocoxa; last external segment of abdomen short, in male its base transversely impressed. Legs short; hind femur only reaching to external segment IV; tars short, segment I little longer than broad, II broader than long, IV as long as I plus II.

Genotype: *Apinotropis verdoornae* sp. n. described below.

Apinotropis verdoornae sp. n.

Black, variegated with grey, the chitin of the light-coloured parts rufescent in some specimens. The pubescence consisting of narrow lanceolate hairs intermingled on upperside with much broader blade-like hairs which are curved down and most conspicuous on head and rostrum and on sides of pronotum and elytra. Segment VIII of antenna white, on the other segments of the funicle the white pubescence nearly restricted to the apices, club black. Pronotum inconspicuously marmorated with black and luteous grey, from base forward a lateral greyish-white patch. Scutellum white. Suture of elytra and most of the alternate interspaces diffusely spotted with black and luteous or grey, from base above shoulder to beyond middle an indefinite grey or luteous stripe chiefly occupying interspace VI, on declivous apical area a transverse band of the same colour, in front of it an ill-defined transverse band. Pygidium greyish or luteous at side, slightly inclining forward in male.

Underside with dispersed grey pubescence, forming a small spot at end of metepimerum and side of last abdominal segment. Legs greyish, middle of femora and on tibiae the base, a patch beyond middle and the apex (especially on underside) black; III of tarsi more or less luteous.

Length (head excepted) ♂ 4·8–6·3, ♀ 7·0 mm.

Breadth ♂ 2·3–3·0, ♀ 3·3 mm.

The large male (type) and the female retained for the British Museum (N.H.) collection, the two paratype males returned to the collector.

It would be interesting to study the mouth-parts and the genitalia of both sexes in detail; for that purpose material would be required for dissection. I have great pleasure in naming the species after its discoverer.

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